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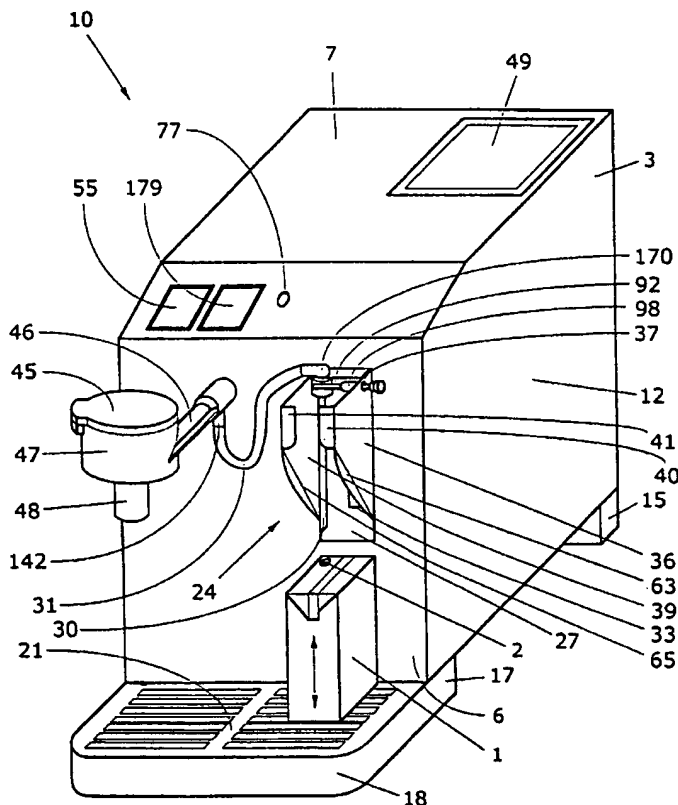
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(54) Title: HOT DRINK DISPENSER



(57) Abstract: Hot drink dispensing machine (10) to be used in offices, households or on public premises, comprising a water tank (50) connected to a boiler (52), a pump (100), an electronic logic control unit (110), a main switch (55), a steam conduit (76) and a hot water conduit (96) all contained in a cabinet (3) of a given shape, as well as an emulsifier (45) held thereon. Said machine is provided with a rigid drawing conduit (30) suitable for penetrating a sealed container (1) and with a switch (33) that turns on the machine when the rigid drawing conduit (30) penetrates the sealed container (1) and the liquid contained in the sealed container (1) is extracted from it and emulsified inside the emulsifier (45) and subsequently poured into a suitable vessel.

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"HOT DRINK DISPENSER"

5

TECHNICAL FIELD

The present invention relates to drink dispensers at large, and particularly to a hot cappuccino dispenser for use in an office or on public premises.

10

BACKGROUND ART

Several types of hot drink dispensing machines are known in the art and many of them have made it to the market and are daily used in bars and cafeterias.

These are all broadly based on the same principle, that is the whipping or emulsification of milk by a steam jet and the mixture thereof with coffee or whatever other flavouring ingredients, followed by the pouring of the final product ready for consumption through a discharge spout.

20 All the above operations are carried out by just one machine, whose components are all contained in a suitably shaped cabinet.

The hot drink dispensers of the prior art that are found in offices, shops and on public premises are not attended to, therefore the flavouring ingredient necessary for the delivery of the product ready for consumption is supplied to the machine in its powdered form, and mixed with hot water and steam.

25 This is quite understandable, as normal cappuccino or hot drink dispensers at large that require fresh or pasteurised milk must necessarily be operated by a person that has skills in doing that.

In fact, the machine enticing the use of steam, it would be unavoidable to have splatters, leakages and

spillings on and around the machine.

Moreover, milk is normally drawn from an open jug or caraffe that has to be kept full all the time.

A large amount of documents and a consequent rather
5 remarkable momentum in the technology development in the
field of the present invention is to be found in coffee
machines.

U.S. Pat. N. 5,490,447 granted to Giuliano discloses
an automatic espresso and cappuccino machine that
10 basically consists of a cabinet enclosing a certain
amount of separate filter units which can be moved
relatively to an operational unit comprising a coffee
filling station, a coffee dispensing station, a filter
cleaning station and a filter washing station. When a
15 portion of coffee is poured into a cup, then the filter
unit is transferred to a filter cleaning station and a
filter washing station where steam is resorted to in
order for the cleaning of the filter to be accomplished.

Cappuccino is made by mixing coffee with emulsified
20 milk obtained through a vacuum suction of milk by a T-
shaped steam carrying tube and mixture thereof with the
freshly brewed coffee.

A drawback of the above invention is that it is not
applicable to offices and unstaffed spots of public
25 premises, as, in order to be operated and to deliver
quality product, the machine disclosed therein must be
attended to and operated by a skilled person.

U.S. Pat. 4,735,133 to Paoletti discloses a device
for heating and emulsifying milk for making cappuccino.
30 The invention revolves around a mechanical assembly
encased in a streamlined covering which comprises a
vacuum chamber surrounding a nozzle and formed with an
emulsion discharge port. An air conduit and a conduit
for the milk that enters the device because of the

negative pressure created by the steam jet are also provided. There is found to occur a mixture of milk, air and steam in a suitable chamber, said mixture being then discharged through a suitable outlet, ready for the
5 addition of coffee.

Once again, it is a limiting drawback of the present invention for the purposes set out above the fact that milk must be drawn from a jug or a suitably shaped container, and the equipment is prone to uncontrollable
10 splattering and leakages, therefore it is absolutely necessary for it to be looked after by a skilled person, terminating its dispensing function after a pre-determined length of time.

DESCRIPTION OF THE INVENTION

15 It is an aim of the present invention that of obviating the inconvenients and drawbacks found in the prior art, by proposing a drink dispenser, particularly a hot drink dispenser, more particularly a cappuccino dispenser, that is suitable for use on public premises
20 and/or offices and/or households, that does not require the presence of a skilled person in order to be operated, therefore easy and immediate to use by an unskilled person.

A further aim of the present invention is that of
25 proposing a hot drink dispenser that is capable of delivering cappuccino starting for example from fresh or pasteurised milk contained in 125 ml packs, otherwise known as brik[®] packs.

The above aims have been accomplished by a drink
30 dispenser, particularly a hot drink dispenser, more particularly a cappuccino machine, whose features are given in the main claims.

Dependent claims outline particularly advantageous forms of embodiment of the present invention.

According to the present invention, the hot drink dispensing machine is enclosed in a cabinet, and it comprises a liquid, namely and not limitedly and not limitedly milk, flavoured milk, sweetened or flavoured water or alikes and/or mixtures thereof or alikes, and/or mixtures thereof, rigid intake conduit to be inserted into a relatively small, for example a 125 ml package, a liquid delivery conduit leading to an emulsifier where the liquid is frothed and foamed, below which a discharge spout is provided, the 125 ml package activating the machine by turning on a microswitch while sliding into a suitably shaped cage when transfixed by the liquid intake conduit. The machine is automatically switched off by a timer switch activated 8 seconds after activation.

15

ILLUSTRATION OF DRAWINGS

Other features and advantages of the present invention will be more evident from the reading of the following description, given by way of not limiting example, with reference to the figure illustrated in the attached table of drawings in which:

20

- figure 1 illustrates a schematical perspective view of a hot drink dispenser according to the present invention,

- figure 2 illustrates a block diagram and plant view of the machine according to the present invention that highlights its tank and piping system and electric circuitry.

25

DETAILED DESCRIPTION OF THE INVENTION

In the figures, a hot drink dispensing machine according to the invention is found contained in a cabinet 3 of a given shape, which has a front wall 6, a back wall (not shown), a top wall 7, a base (not shown) and two respectively right and left side walls, the former not shown and the latter 12.

30

Said cabinet 3 weighs on four supports 15; furthermore, a tray shaped base 18 suitable for receiving drops and spills from glasses or cups, and covered with a slotted lid 21, is placed under said front wall 6.

5 Within cabinet 3 there is found to be present an electronic control logic unit 110, which is connected to on/off switch 55 via wire 56.

Fixed onto its front wall 6, the cabinet is provided with a holding cage 24 for the liquid, package 1, which,
10 on sliding upward along its rear wall 27, has its upper hole 2 transfixated by a rigid liquid intake conduit 30, and starts the machine acting on microswitch 33.

Said liquid package is for example a 125 ml liquid ounce briks® pack.

15 Sides 36 and 39 of holding cage 24 are oblique at their lower edges and diverge along a downward direction forming wings 63 and 65, so that less care may be taken when inserting package 1 into said holding cage 24.

Moreover, side walls 36 and 39 of holding cage 24
20 are provided with two top tabs 40 and 41 that run parallel to front wall 6 of cabinet 3, this in order to prevent package 1 from moving back and forth.

Left wall 36 of holding cage 24 is provided with a hole 37 through which a long screw 92 runs horizontally,
25 said long screw 92 being suitable for securing liquid intake conduit 30 to a fixed position.

Microswitch 33, activated by the sliding of package 1 into holding cage 24, is connected to electronic control logic unit 110 via wire 91.

30 A water tank 50 is connected to pump 100, by a cold water conduit 83, and pump 100 is connected to boiler 52 by another cold water conduit 53. Pump 100 is further linked to electronic logic control unit 110 by wire 139.

Water tank 50 is provided with a water level

detector 51, whereas boiler 52 is provided with an electric heater 152 connected to unit 110 by wire 169, and a pressure-meter 58 that is connected to unit 110 by wire 310.

5 When in use, boiler 52 is divided into two portions, an upper portion for steam kept for example at a 1.1 bar pressure, and a lower portion for hot water.

10 The top wall of boiler 52 is provided with outlet 84, leading into a steam conduit 76 provided with an electrovalve 75, said electrovalve being connected to unit 110 by wire 149, and an outlet 151 equipped with a drawing tube 94, leading into a hot water conduit 96 that is provided with an electrovalve 70, said electrovalve 70 being connected to unit 110 by wire 159.

15 Steam conduit 76 and hot water conduit 96 join together at T-joint 42, leading into an emulsifier 45 down a conduit 86 and an inlet 46.

20 Adjacent to liquid intake conduit 30 is a liquid delivery conduit 31 for transfer of liquid from package 1 via L-joint 170, liquid transfer conduit 31, T-joint 142 into emulsifier 45 provided with inlet 46, chamber 47 and downward pointing discharge spout 48. Emulsifier 45 of the hot drink dispensing machine according to the present invention is provided with is a per se known device, as
25 that described in U.S. Patent N. 4,715,274 to Paoletti, which is hereto incorporated in full, or alternatively U.S. Patent N. 5,189,949 to Apa which is also fully incorporated to the present specification.

30 After water tank 50 has been filled up, upon action on main switch 55, pump 100 is activated and water is drawn from water tank 50 into boiler 52, heater 152 switches on and pressure in boiler 52 is taken up to and kept at a suitable value, approximately 1.1 bar for example.

As soon as a full package 1 is inserted into holding cage 24, control unit 110 activates electrovalve 75 that lets steam from boiler 52 down steam conduit 76 to joint 42, and down conduit 86 into emulsifier 45, sucking, 5 frothing and foaming at T-joint 142 the liquid contained in package 1 and drawn up liquid drawing conduit 30 and along liquid transfer conduit 31 and jetting it through inlet 46 into emulsifier 45 where it is heated to for example 60-65 °C temperature, to yield the finished 10 portion of cappuccino or similar hot drink, by gravitational pouring thereof into a cup or glass.

Discharge spout 48 may be single for single doses, or, alternatively, it may well branch into two and deliver two predetermined doses, or portions, of hot 15 foamed or frothed drink, simultaneously, in so doing using up the full capacity of a four liquid ounce package.

The operating of the machine is either time-controlled with cycles lasting 8 to 10 seconds, or it 20 stops when the full content of package 1 has been used up.

At the end of each dispensing cycle, electrovalve 70 is activated and a washing cycle is started, as hot pressurised water is circulated into the whole of the 25 system, this including liquid transfer conduit 31, L-joint 170 and liquid drawing conduit 30, causing little water to spill down discharge spout 48.

The washing cycle is for example 1.3 seconds long.

Alternatively, electrovalve 70 can be switched on 30 manually by resorting to switch 179.

On safety grounds, the electronic logic control unit 110 is programmed so as to stop the pump if this has uninterruptedly functioned for a predetermined time period, for example 60 seconds.

A new operational cycle will be started when a new package is inserted into holding cage 24.

Top wall 7 of cabinet 3 is provided with a hatch 49 into a water tank 50, for reloading and checking
5 purposes.

According to a further form of embodiment, washing cycles can be preprogrammed to take place after a certain fixed number of portions of hot drink have been dispensed.

10 Water tank 50 is provided with a minimum water level detector 51 connected to electronic logic control unit 110 via wire 61, and to light 77 that signals that the tank is empty when this condition occurs.

Once the water meniscus interacts with water level
15 detector 51 or leaves it uncovered, light 77 turns on and machine 10 automatically turns off.

The invention was previously described with reference to some of its particular forms of embodiment.

It is nonetheless clear that the invention is not
20 limited to these forms of embodiment, but that it comprises all modifications and variants that may be taken into consideration, without in so doing stepping out of the scope of the present patent as it is defined in the appended claims.

25 According to a further form of embodiment, the hot drink dispensing machine 10 according to the present invention is provided with a cylindrically shaped holding cage 24, suitable for example for hosting a bottle shaped sealed container provided with a soft sealing on its top.

30 According to further embodiments of the present invention, holding cage 24 has a shape that is suitable for hosting containers of any shape.

According to another form of embodiment, switch 33 may be constituted by a manually operated switch, e.g. a

push-button or a knob switch, whereby the hot drink dispenser is manually activated by the user after inserrrtion of container 1 into holding cage 24.

Finally, the invention has been described with
5 reference to a rather sophisticated form of embodiment comprising several electrovalves which are controlled by a suitable electronics. However, it is clear that the invention includes forms of embodiment too, according to which the dispenser is operated in a manual, rather than
10 in an automatic way.

CLAIMS

1. Hot drink dispensing machine (10) to be used in offices, households or on public premises, comprising a water tank (50) connected to a boiler (52), further comprising a pump (100), an electronic logic control unit (110), a main switch (55), a steam conduit (76) and a hot water conduit (96) all contained in a cabinet (3) of a given shape, as well as an emulsifier (45) held thereon, characterised in that it is provided with a rigid drawing conduit (30) suitable for penetrating a sealed container (1), as well as with a holding cage (24) fixed onto the front wall (6) of the cabinet (3), said cage (24) being suitable for holding said sealed container (1) and for preventing any movement thereof during extraction of the liquid therefrom, and in that it is further provided with a switch (33) suitable for turning on the machine once the rigid drawing conduit (30) has penetrated said sealed container (1) whereby the liquid contained in the sealed container (1) is extracted therefrom and emulsified inside said emulsifier (45) and subsequently poured into a suitable vessel.
2. Hot drink dispensing machine according to claim 1, characterised in that said switch (33) is a push-button switch or a knob switch located on said cabinet (3) and suitable for being manually operated by a user once said rigid drawing conduit (30) has penetrated said sealed container (1).
3. Hot drink dispensing machine according to claim 1, characterised in that said switch (33) is a microswitch activated by said container (1).

4. Hot drink dispensing machine (10) according to anyone of the preceding claims, characterised in that said sealed container (1) is a single or double
5 dose pack full of a fresh and/or pasteurised drinkable liquid.
- 5 Hot drink dispensing machine (10) according to anyone of the preceding claims, wherein the holding
10 cage (24) is shaped in any way according to the shape of said sealed container (1).
6. Hot drink dispensing machine (10) according to anyone of the preceding claims, characterised in
15 that said steam conduit (76) and said hot water conduit (96) are both provided with at least one electrovalve (75, 70).
7. Hot drink dispensing machine (10) according to anyone of the preceding claims, characterised in
20 that steam conduit (76) and hot water conduit (96) join at a T-joint (42), that leads into said emulsifier (45), whereinto said liquid is drawn by suction exerted by steam at T-joint (142) from said
25 liquid drawing conduit (30) and an adjacent liquid transfer conduit (31).
8. Hot drink dispensing machine (10) according to anyone of the preceding claims, characterised in
30 that a hot water electrovalve (70) is activated at the end of every dispensing cycle, in order for all the conduits to be properly washed and prepared for the next dispensing cycle.

9. Hot drink dispensing machine (10) according to anyone of the preceding claims, characterised in that the boiler (52) is provided with a steam outlet (151), leading into steam conduit (76), and with a hot water outlet (152) leading into hot water conduit (96).
10. Hot drink dispensing machine (10), according to anyone of the preceding claims, characterised in that the water tank (50) is provided with a water level detector (51), that activates turning on a light (77) and switching off the machine (10) when the water meniscus in the tank interacts with it or leaves it uncovered.
11. Hot drink dispensing machine (10) according to anyone of the preceding claims, characterised in that a dispensing cycle lasts approximately 8 to 10 seconds and a washing cycle lasts approximately 1.3 seconds.
12. Hot drink dispensing machine according to claim 11, characterised in that the washing cycle starts automatically at the end of each dispensing cycle.
13. Hot drink dispensing machine (10) according to claim 11, characterised in that the washing cycle is started manually operating on a switch (55).

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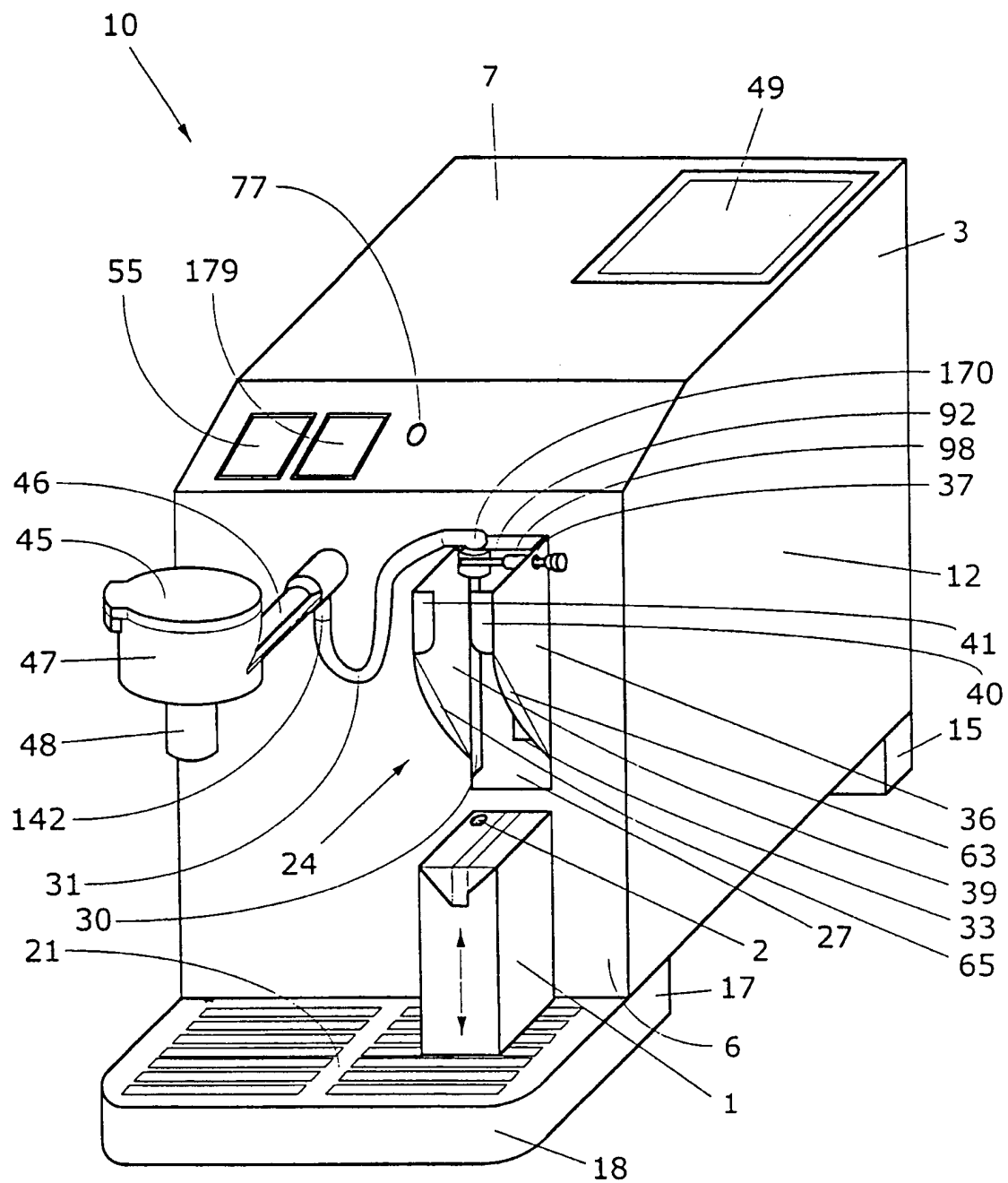


Fig. 1

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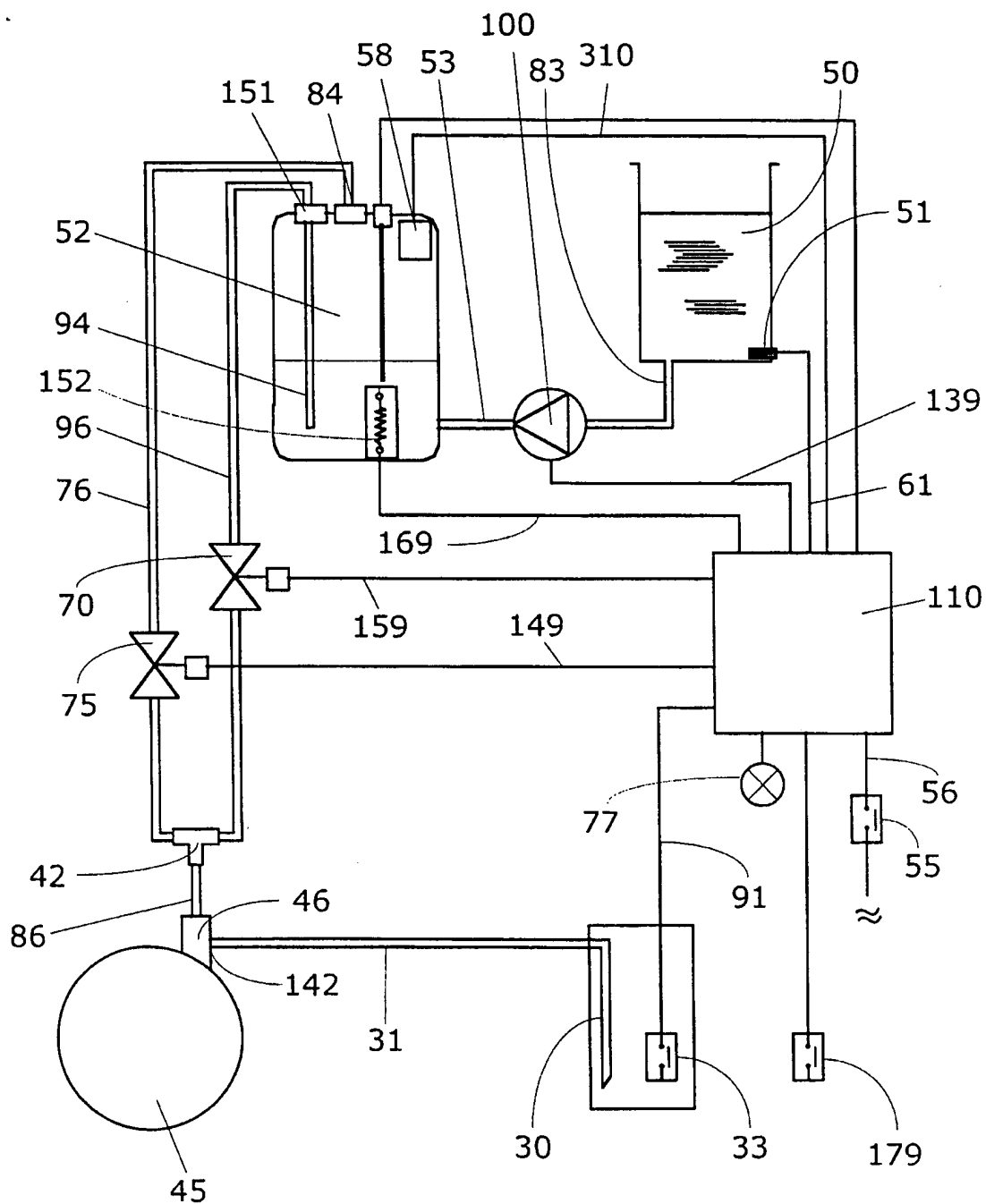


Fig. 2

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/01630

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A47J31/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 91 00041 A (NUOVA FAEMA S.P.A.) 10 January 1991 (1991-01-10)	1,2,4-6
Y	page 2, paragraph 6 -page 8, paragraph 5; figures 1,2	7-9,13
Y	EP 0 791 321 A (GAGGIA ESPANOLA SA.) 27 August 1997 (1997-08-27) column 2, line 16 -column 3, line 25; figures 1,2	7-9,13
X	US 5 498 757 A (JOHNSON ET AL) 12 March 1996 (1996-03-12) column 2, line 55 -column 6, line 38; figure 1	1,2, 4-10,13
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"A" document member of the same patent family

Date of the actual completion of the international search

7 June 2000

Date of mailing of the international search report

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Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Inter. nal Application No
PCT/IB 99/01630

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 94 10 129 U (C.M.A. S.P.A.) 13 October 1994 (1994-10-13) page 3, last paragraph -page 6, paragraph 2; figures 1,2,6,7	1,2,4,5
A	US 5 473 972 A (RIZZUTO ET AL) 12 December 1995 (1995-12-12) column 1, line 66 -column 2, line 61; figures 1-3	1

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Information on patent family members

International Application No

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